Guidelines to write a report

- Report
  - A Report is a technical document, describing an engineering problem, and the work performed to solve it.
  - A Report should formulate the problem under study, describe the methods used to solve it, analyse the performance of the used methods, and present the conclusion of the work.
  - The report should be organised in a way that allows an easy understating of the work done, assuming that the reader has basic knowledge of the area, but that does not the problem under study.
  - The report should be give the reader, in a gradual way, the necessary information for the understanding of the problem, of the methods used, and of the results obtained. Hence, one should not use concepts that have not been previously introduced (except if they are of common knowledge).
- General format
  - The paper format should be A4 size.
  - The margins should be 2.5 cm, either vertical or horizontal.
  - **Times Roman 12 pt** font, with a spacing of either **1.5 lines** or **At least 22 pt** should be used for normal text. A larger font should be used for headings, and additional spacing should be left after it.
  - **Arab numbering** (1, 2, 3, ...) should start only at the first page of Introduction. Before that, **small Roman numbering** (i, ii, iii, ...) should be used.
  - Page numbering should start at the page following the cover page.
- Structure
  - The structure of the report should be (starting in separate pages, odd numbered):
    - cover page, containing institution, title of the work, authors, place and date
    - name of supervisor, his department and institution
    - Acknowledgements
    - Abstract and Keywords (one single page for both, and the latter at the end of the page)
    - Table of Contents
    - List of Figures
    - List of Tables
    - List of Acronyms
    - List of Symbols
    - List of Programmes
    - 1. Introduction
    - 2. Chapter ....
    - 3. Chapter...
    - ...
    - ?. Conclusions
    - A. Annex ...
    - B. Annex ...
    - ...
    - References
- Contents and structure of chapters
• The **Abstract** should state the problem under study, the methods used, and the main conclusions. It should not contain any general statements, but only very short sentences. It should contain, when it is the case, the main numerical results.

• **Keywords** should be 5 or 6, representing the main areas of the work.

• **Lists** of figures and tables should contain all those existing in the report, annexes included.

• **Lists** of figures, tables, symbols, and others, should be sorted.

• The **Introduction** should start by giving very general information on the system/model, and as it progresses, more specific information should be given, until the topic dealt with in the report is referred. It should describe, in a concise way, the problem under study, and the main methods used in the work. It should also contain the state of the art, referring other alternatives for the solution of the problem. After that, the contents and structure of the report must be described.

• The structure of chapters should be in a way that sections and subsections are included, each one containing separate parts of the work. The first section must start in the beginning of the chapter. Do not include sections or subsections with a length less than one page. Do not create only one section (subsection) inside a chapter (section).

• **Conclusions** are supposed to have the main results from the work, presenting numbers for the main results, orders of magnitudes, which techniques or models were the best, a critical analysis of the limitations, and possible directions for future work.

• **Annexes** contain additional information, that is not the main concern of the work or that is supplementary to the main work (like presenting graphs for other simulated situations, or the derivation of an expression).

• **General**
  
  • Acronyms must always be defined the first time they are used in the text.
  
  • Write the report in the present form (except if you are reporting on experiments or measurements), and do not use the first person (either singular or plural), but rather the impersonal. For example:

  This paper addresses how to write a report. One should not be offended if many of the hints given here are already known.

  • Avoid telegraphic or literary styles of writing, that is to say, sentences should not be too short or too long, and do not use a non-technical way of writing.

  • Avoid using adjectives, except when they can be quantified.

  • Paragraphs should be separated between each other, either additional vertical space before them, or by additional horizontal space at the beginning of each one.

  • Use the **Spelling** from the word processor, before printing the text.

  • The report should have a coherent and homogeneous style.

  • Pages should be numbered at the footnote, either at the centre, or alternative at right and left for odd and even pages respectively.

  • Do not include references in the titles of Chapters, Sections or Subsections.

  • Do not leave the title of a section or subsection isolated at the end of a page.

  • Do not start a section by referring to its title, i.e., one should not write:

    2.2.2. Erlang Model

    This model is used in ...

• **Equations and mathematics**
  
  • Equations should be left justified, and numbered by chapters as well. For example:

  

  \[ c = f \lambda \]  

  (3.4)

  • The mathematical symbols should be written in **Italic** form, except for the Greek ones.
• Always define the symbols after the equations, the first time they are introduced.
• Always indicate the units of the parameters (in subscript), when they are not in their basic ones. For example
\[ EIRP_{[dBm]} = P_e_{[dBm]} + G_e_{[dBi]} \]  \hspace{1cm} (2.1)
• Do not use the same symbol to signify different entities.
• A symbol should be written always in the same form, i.e., with the same font size and type, with the same meaning, etc.
• When one has numbers larger than one thousand, one should use a space separating groups of thousands, i.e., one should use 12 345 instead of 12345.
• When using numbers lower than 1, one should always put the zero on the left, i.e., one should use 0.25 instead of .25.
• Refer to equations only by their number, except in the beginning of a phrase. For example:
One can deduce from (2.30) that there is no dependency on the frequency. Equation (3.34) shows the dependency with frequency.

Figures and tables
• There are Figures and Tables, and nothing else (like Graphs, Drawings, ...).
• If one wishes, one can use the shortcut Fig.
• Figures and Tables should be numbered by chapters.
• Figures and Tables should be horizontally centred in the text.
• In general, numbers should be given with the same accuracy in each table.
• Numbers in tables should not be centred, but aligned by their order of magnitude, so that their different values is easily perceived.
• Captions must be included, and they should be centred. For example:
  Figure 2.1 - Mobile unit.
  Table 3.5 - List of parameters.
• Figures’ captions should come after them, while Tables’ should be located before.
• In the case Figures have multiple graphs (like (a), (b), (c)), the particular caption should be included near the graph, and not together with the general caption.
• Additional spacing should be left before and after them.
• Figures and Tables should be placed in the text only after they have been referenced, which should always happen.
• When Figures and Tables do not fit at the end of a page, one should not leave the corresponding space empty, and locate them at the beginning of the next page. Rather, one should continue the text, filling in the space until the beginning of the next page, where the Figures and Tables should be located. Therefore, it is not compulsive to put them immediately after they are referred to in the text.
• Figures showing graphs must have legends in both axes, with the entity that is represented and its units. For example
\[ EIRP_{[dBm]} \]
• Do not repeat the title of a graph above it, when the information is in the caption of the Figure.
• When you refer to Figures and Tables in the text, they should not appear between brackets. For example:
One can observe that power decays monotonously, Fig. 3.4.
• If you copy Figures from books or papers, refer to them in the caption. For example:
  Figure 4.5 - Propagation scenario (extracted from [6]).

References
• References should be included along the text, when results from other authors are used or referenced. For example:
The results from Meat and Fish [2] have been extensively used since the beginning of mankind.
• They should be numbered by the order they appear in the text.
• Do not include references that were not quoted in the text.
• In the text, but never in the list of references, one can use et al. when referring to more then two authors. For example, Okumura et al. [2] performed measurements in a wide range of frequencies.
• References should be given in full form. The format should be
  • For a book
  • For a paper in a journal
  • For a communication in a conference
  • For a thesis
  • For an internal report
  • For a document from the Internet
• Another approach can be used for references, by using 4 letters and 2 digits instead of numbering them by order of appearance: the 4 letters refer to the authors while the 2 digits refer to the year of publication. For the examples given above one has: [1] - [Pars92], [2] - [Fern95], [3] - [CoFr94], [4] - [Mock89], [5] - [CBMF94].
• The list of references at the end of the report should be sorted, either by numbering order or by alphabetic one, according to the case.
• **Before printing the report, verify if it has been written according to these guidelines. Do exercise your self-criticism before giving the text to any one else to read it.**